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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/236,113	01/25/1999	XU SHI	1581.0250001	1912

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EXAMINER

CANTELMO, GREGG

ART UNIT

PAPER NUMBER

1745

27

DATE MAILED: 10/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/236,113	SHI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Gregg Cantelmo	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 02 September 2003.
- 2a) This action is FINAL.                  2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-16 and 26-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-16 and 26-28 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Response to Amendment***

1. In response to the amendment received September 2, 2003:
  - a. The prior art rejections are withdrawn in light of the amendment.

***Double Patenting***

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claim 10 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 6,413,387 (Shi) in view of U.S. patent No. 5,468,363 (Falabella '363). Although the conflicting claims are not identical, they are not patentably distinct from each other.

Both the instant claims and the claims of Shi claim a cathodic arc source comprising a cathode station with a target, first means for generating a magnetic field having a first direction and second means for generation a second magnetic field having

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a second direction opposite to that of the first wherein the first means are located below the target and the second means are located above the target and the resultant magnetic field normal to the target has a point of zero field strength above the target (claims 1, 15 and 16 as applied to claim 10).

The system includes vacuum chamber and anode (claim 5 as applied to claim 10).

The differences between the instant claims and Shi is that Shi does not claim a macroparticle filter (claim 10).

Falabella '363 discloses using a macroparticle filter 11 to prevent macroparticles from bouncing off the walls of the chamber and prevent reaching the part to be coated (as applied to claims 1, 10, 11, 14, and 26).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Shi by claiming a macroparticles since it would have prevented macroparticles from bouncing off the walls of the chamber and prevented reaching the part to be coated.

4. Claims 1, 3-11, 13-16 and 26-28 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 6,413,387 (Shi) in view of U.S. patent No. 5,468,363 (Falabella '363).

Although the conflicting claims are not identical, they are not patentably distinct from each other.

Both the instant claims and the claims of Shi claim a cathodic arc source comprising a cathode station with a target, first means for generating a magnetic field

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having a first direction and second means for generation a second magnetic field having a second direction opposite to that of the first wherein the first means are located below the target and the second means are located above the target and the resultant magnetic field normal to the target has a point of zero field strength above the target (claims 1, 15 and 16 as applied to claims 1, 3-9, 11, 13-16 and 26-28).

The apparatus of Shi having the same structural arrangement and claiming coils for the means (thus electromagnets) can provide for any number of magnetic strength arrangements so long as the point of zero field is located above the target (as applied to claims 3-7).

The zero field is 3-7 cm above the target (claim 7 as applied to instant claim 8).

A steering means is provided to configure the ions into a beam (claim 14 as applied to claims 9 and 28).

The coil current is varied to generate the resulting point of zero field strength as claimed. Thus the coil current is varied to optimize arc striking (as applied to claims 13 and 27).

The system includes vacuum chamber and anode (claim 5 as applied to claims 1, 11 and 26).

The differences between the instant claims and Shi is that Shi does not claim a macroparticle filter (claims 1, 11, 13 and 26) of using a carbon or graphite target (claims 1, 11 and 26) and of the first and second field being co-axial and co-axial with the plasma (claim 15).

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Falabella '363 discloses using a macroparticle filter 11 to prevent macroparticles from bouncing off the walls of the chamber and prevent reaching the part to be coated (as applied to claims 1, 11, 14, and 26).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Shi by claiming a macroparticles since it would have prevented macroparticles from bouncing off the walls of the chamber and prevented reaching the part to be coated.

Placement of the first and second magnetic field means to be co-axial would have been obvious. In order to generate the resultant magnetic field, the first and second means must be positioned about the cathode. This enables the opposing polarities of the two means to generate the desired point of zero field strength as claimed.

Thus it would have been obvious to place the means symmetrically about the cathode to have provided an optimal position for the first and second magnetic field means to create the claimed magnetic field arrangement.

Additionally providing the means to be coaxial with respect to the plasma would have enhanced the ability to control the focus of the plasma such as the arrangement shown in Falabella with the macroparticle filter. Therein the magnetic means are coaxial about the system for optimal magnetic field formation and plasma steering.

With respect to the target material:

Falabella '363 discloses that the use of graphite targets in cathodic arc deposition systems and processes is well known in the art (col. 3, ll. 55-60).

The motivation to using graphite as the cathode source is to deposit carbon films on a substrate.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Shi by claiming graphite cathode or target materials since selection of a preferred material would have been an obvious choice dependent upon the requisite coating to be applied to the substrate, graphite being a known cathode source. Selection of a known material on the basis of its suitability for the intended use has been held to be a matter of design choice. *In re Leshin* 125 USPQ 416.

5. Claims 2 and 12 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of Shi in view of Falabella '363 and U.S. patent No. 5,458,754 (Sathrum).

See item 4 above incorporated herein.

The additional difference between claims 2 and 12 and the claims of Shi is that Shi does not claim that the chamber is the anode (claim 2) or of striking an arc between the cathode and the anodic chamber (claim 12).

Use of the chamber as the anode for arc generation is conventionally known in the art. See Fig. 2 of Sathrum.

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Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Shi by claiming an anodic chamber since it would have provided a means for assisting in the generation of the arc.

### ***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. Note that these telephone numbers will change around January 1, 2004. At such time the examiners new telephone number will be (571) 272-1283 and the examiner's supervisor's number will be (571) 272-1292. FAX communications should be sent to FAX number: (703) 872-9306. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gregg Cantelmo  
Patent Examiner  
Art Unit 1745

gc



October 30, 2003